

26 MAY 2005

REC'D 10 DEC 2004

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PCT
INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PD53548PC	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP 03/13001	International filing date (day/month/year) 20.11.2003	Priority date (day/month/year) 26.11.2002
International Patent Classification (IPC) or both national classification and IPC H01Q1/24		
Applicant SONY ERICSSON MOBILE COMMUNICATIONS AB ET AL.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I Basis of the opinion
- II Priority
- III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV Lack of unity of invention
- V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI Certain documents cited
- VII Certain defects in the international application
- VIII Certain observations on the international application

Date of submission of the demand 13.05.2004	Date of completion of this report 10.12.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Van Dooren, G Telephone No. +31 70 340-2952



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP 03/13001

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-12 as originally filed

Claims, Numbers

1-20 received on 02.07.2004 with letter of 30.06.2004

Drawings, Sheets

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.:
- the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP 03/13001

5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	2-12, 15-20
	No: Claims	1,13,14
Inventive step (IS)	Yes: Claims	8-12,15-17
	No: Claims	1-7,13,14,18-20

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. The following documents (D) are referred to in this communication; the numbering will be adhered to in the rest of the procedure:
D1: WO 02 25769 A (ERICSSON TELEFON AB L M ;ALI MOHAMMOD (US)) 28 March 2002 (2002-03-28)
D2: US-B1-6 272 356 (DOLMAN RODNEY A ET AL) 7 August 2001 (2001-08-07)
2. Introductory remarks
- 2.1 The application does not meet the requirements of Article 6 PCT, because claims 1,6,20 are not clear.
- 2.2 The term "...stretching along **the end**..." used in claims 1 and 20 is vague and unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claim unclear (Article 6 PCT). Further to independent claim 1, this claim is defined to be a portable communication device, but the same device is referred furtheron in the claim as 'phone', cf. line 8.
- 2.3 The same holds for the formulation "...at a position **close to** the connection point..." as used in claim 4 (Article 6 PCT).
- 2.4 Although claims 1 and 20 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.
- 2.5 It is clear from the description on page 7, lines 21-30 that the following feature is essential to the definition of the invention:
 - (1) the first antenna element 22 is electrically connected to a second cylindrical

antenna element 24 at the first end.

Since independent claims 1 and 20 do not contain this feature they do not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

3. The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document):
a portable communication device (100) comprising:

- a first part (170) comprising a first antenna element (190) located within and extending through a major portion of the first part and a radio circuit feeding antenna elements in the device,
- a second part (180) hingedly joined to an end of the first part for providing at least one open and one closed position of the [phone], and
- a hinge element (172) connected to the first and second parts, stretching along the end of the first part for providing rotation of one part in relation to the other part around a first axis and having a first and second end, said hinge element comprising a second antenna element (302;310),
- a third antenna element (304) located within and extending through a major portion of the second part (180) and being electrically connected to the second antenna element at least at the first end of the hinge element,

wherein the radio circuit is connected between the first and second antenna elements for feeding them.

The subject-matter of claim 1 is therefore not new (Article 33(2) PCT).

4. D1 further discloses an antenna arrangement to be provided in a portable communication device having

- a first part (170) including a radio circuit feeding antenna elements in the device (on 190),
- a second part (180) hingedly joined to an end of the first part,
- and a hinge element (172) connected to the first and second parts and providing an open and a closed position of the portable communication device, the hinge element stretching along the end of the first part for providing rotation of one

part in relation to the other part around a first axis and having a first and second end,

wherein the antenna arrangement comprises:

- a first antenna element (190) to be located within and extending through a major portion of the first part of the portable communication device and to be connected to the radio circuit, and
- a second antenna element (302; 310) to be connected to the radio circuit,
- a third antenna element (304) to be located within and extending through a major portion of the second part (180) and to be electrically connected to the second antenna element at least at the first end of the hinge element.

4.1 The subject-matter of claim 20 differs from this known antenna arrangement in that the second antenna element is to be located in the hinge element of the portable communication device and also

The subject-matter of claim 20 is therefore new (Article 33(2) PCT).

4.2 The problem to be solved by the present invention may be regarded as how to save space in locating the second antenna element inside a portable communication device.

The solution to this problem proposed in claim 20 of the present application is considered as not involving an inventive step (Article 33(3) PCT) because locating an antenna inside a hinge element is known to the person skilled in the art, cf. D2, fig. 3a.

5. Dependent claims 2-7, 13, 14, 18, 19 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT with respect to novelty and/or inventive step, because the additional features of these claims are either known from D1 and/or D2, or the additional features of these claims are considered to be obvious over D1.

6. Claims 8-12, 15-17 appear to meet the requirements of the PCT with respect to novelty and inventive step, as their subject matter is neither disclosed nor suggested by the available prior art as given in D1-D2.

7. Concluding remarks

7.1 The description is not in conformity with the claims as required by Rule 5.1(a)(iii) PCT.

7.2 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1-D2 is not mentioned in the description, nor are these documents identified therein.

* * * * *

CLAIMS

**REPLACED BY
ART 34 AMDT**

1. Portable communication device (10) comprising:
 - 5 a first part (12) comprising a first antenna element (22) located within and extending through a major portion of the first part and a radio circuit (30) feeding antenna elements in the device,
 - 10 a second part (14) hingedly joined to an end of the first part for providing at least one open and one closed position of the phone, and a hinge element (16) connected to the first and second parts, stretching along the end of the first part for providing rotation of one part in relation to the other part around a first axis (32) and having a first (17) and second end, said hinge element comprising a second antenna element (24; 40), wherein the radio circuit is connected between the first and second antenna elements for feeding them.
- 15 2. Portable communication device according to claim 1, wherein the second antenna element is provided in the interior of the hinge element.
- 20 3. Portable communication device according to claim 1 or 2, wherein the second antenna element encircles the axis of rotation defined by the hinge element.
- 25 4. Portable communication device according to any previous claim, wherein the radio circuit is connected to the second antenna element between the first and second ends of the hinge element.
5. Portable communication device according to claim 4, wherein the radio circuit is connected to the second antenna element in proximity of the second end of the hinge element.
- 30 6. Portable communication device according to any previous claim, wherein the radio circuit is connected to the first antenna element at a position close to the connecting point between the second antenna element and the radio circuit.
- 35 7. Portable communication device according to any previous claim, wherein the first antenna element is electrically connected to the second antenna element at the first end (17) of the hinge element, thereby providing a gap between the first and second antenna elements, the length of which is essentially defined by the first and second ends of the hinge element.

8. Portable communication device according to claim 7, wherein the electrical connection between the first and second antenna elements provides a screen for conductors provided between at least the first part and the hinge.
- 5 9. Portable communication device according to claim 8, wherein the electrical connection between the first and second antenna elements is provided by the screening of a screened cable.
- 10 10. Portable communication device according to any previous claim, further comprising a third antenna element (26; 34, 36; 36, 40) located within and extending through a major portion of the second part and being electrically connected to the second antenna element at least at the first end of the hinge element.
- 15 11. Portable communication device according to claim 10, wherein the electrical connection between the second and third antenna elements provides a screen for conductors provided between at least the second part and the hinge.
- 20 12. Portable communication device according to claim 11, wherein the electrical connection between the second and third antenna elements is provided by the screening of a screened cable.
- 25 13. Portable communication device according to any of claims 10 - 12, wherein the second and third antenna elements are only electrically connected at the first end of the hinge element, thereby providing a gap between the third and second antenna elements, the length of which is essentially defined by the first and second ends of the hinge element.
- 30 14. Portable communication device according to any of claims 10 - 12, wherein the third and second antenna elements are provided with at least one further connection (35) arranged to interconnect the elements when in the open position of the device and to be disconnected when the device is in the closed position.
- 35 15. Portable communication device according to claim 14, wherein the further connection is a continuous connection essentially provided along the whole length of the hinge element.

ART 34 M.D.T.

16. Portable communication device according to claim 14 or 15, further including more than one further connection between the second and third antenna elements.

5 17. Device according to any of claims 10 - 16, wherein the second part includes a first section connected to the hinge element and a second section, where the second section is rotatable around a second axis (38) In relation to the first section, said second axis being provided essentially perpendicular to the first axis.

10 18. Device according to claim 17, wherein the third antenna element includes a first (34; 40) and second (36) section, the first section of which is provided in the first section of the second part and the second section of which is provided in the second section of the second part, said first and second parts of the third antenna section being electrically connectable to each other along the whole interface between the first and second sections of the second part.

15 19. Device according to any previous claim, wherein the radio circuit includes at least one tuning network for tuning the antenna to one or more frequency bands.

20 20. Device according to any previous claim, in which it is a cellular phone.

25 21. Antenna arrangement to be provided in a portable communication device (10) having a first part (12) including a radio circuit (30) feeding antenna elements in the device, a second part (14) hingedly joined to an end of the first part, and a hinge element (16) connected to the first and second parts and providing an open and a closed position of the portable communication device, the hinge element stretching along the end of the first part for providing rotation of one part in relation to the other part around a first axis (32) and having a first (17) and second end, wherein the antenna arrangement comprises:
30 a first antenna element (22) to be located within and extending through a major portion of the first part of the portable communication device and to be connected to the radio circuit, and
35 a second antenna element (24; 40) to be located in the hinge element of the portable communication device and also to be connected to the radio circuit.